

**Nomination of**

**Antenna DSS-46 Canberra Deep Space Communication Complex, ACT**

**For Recognition under the Engineers Australia**

**ENGINEERING HERITAGE RECOGNITION PROGRAM**



**Nomination by**

**Engineering Heritage Canberra, and**

**Canberra Deep Space Communication Complex**

**June 2009**

The Administrator  
Engineering Heritage Australia  
Engineers Australia  
Engineering House  
11 National Circuit  
BARTON ACT 2600

**Nomination for a National Engineering Heritage Landmark**  
**Antenna DSS-46 Canberra Deep Space Communications Complex, ACT**

**Introduction**

Engineering Heritage Canberra in conjunction with the Canberra Deep Space Communication Complex wish to nominate the Deep Space Station Antenna DSS-46 at the Canberra Deep Space Communication Complex (CDSCC), Tidbinbilla in the ACT for recognition under the Engineering Heritage Recognition Program of Engineers Australia. This antenna played an integral part in Australia's involvement in one of the greatest engineering achievements of the 20<sup>th</sup> century, that of sending man to the moon and returning him safely again.

**Name of Work:** Deep Space Station Antenna DSS-46.

The above mentioned work is nominated to be awarded a National Engineering Heritage Landmark.

**Location:** Canberra Deep Space Communication Complex, Tidbinbilla, ACT.

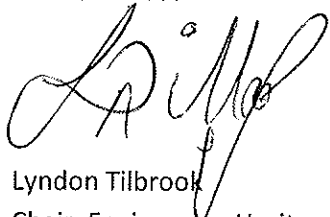
**Owner:** NASA, Canberra Deep Space Communication Complex, Tidbinbilla, ACT.

The owner has been advised of this nomination and a letter of agreement is attached.

**Access to Site:** The site is open to the public daily. An extensive visitors' centre at the Complex provides detailed information about the antennas and the role of the Complex in deep space exploration.

**Nominating Bodies:** The nomination is jointly submitted by the Canberra Deep Space Communication Complex and Engineering Heritage Canberra.

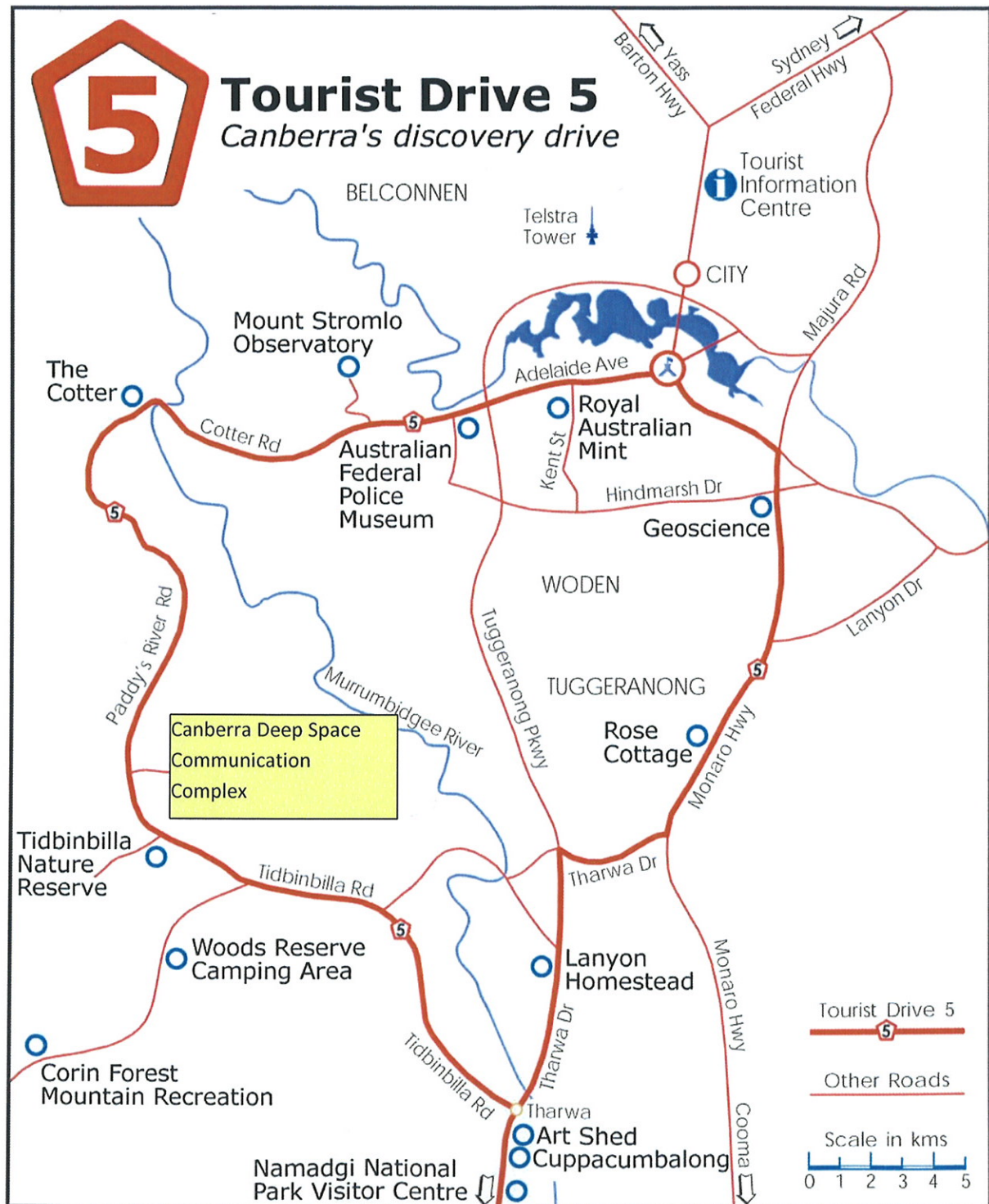
Dr Miriam Baltuck  
CDSCC Director  
June 2009



Lyndon Tilbrook  
Chair, Engineering Heritage Canberra  
19 June 2009

## Location Map

The Canberra Deep Space Communication Complex is located on Paddys River Road, approx 35 km South West from Canberra.



## **BASIC DATA**

**Item Name:** Deep Space Station Antenna DSS-46.

**Location:** Latitude: 35° 24' 04".918 South Longitude: 148° 58' 53" .574 East Altitude: 666.8 m

**Address:** 421 Discovery Drive, Tourist Drive 5 off Paddys River, Cotter and Tidbinbilla Rds  
Tidbinbilla ACT

**Local Government Area:** ACT.

**Owner:** NASA.

**Current Use:** Communications antenna within NASA's Deep Space Communication Network.

**Former Use:** Between 1965 and 1981 the antenna was located at the nearby Honeysuckle Creek facility (now defunct) as part of NASA's Manned Space Flight Network.

**Designer:** NASA.

**Maker/Builder:** NASA.

**Year of Construction.** Originally 1965. **Relocated From Honeysuckle Creek to Tidbinbilla:** 1981.

**Physical Description:** Axes Configuration: X-Y, Reflector Size: 26 m, Height: 35 m,  
Transmitting Bands: S band (2025–2120 MHz), Receiving Bands: X band (8400–8500 MHz) S band  
(2200–2300 MHz), Reflector Accuracy: within 1.2 mm, Pointing Accuracy: within 0.1°,  
Turning Rate: 5° per second but limited to 3° per second.

**Physical Condition:** Excellent.

**Modifications and Dates:** 1983 – enlarged.

**Historical Notes:** Antenna DSS-46 was constructed at Honeysuckle Creek in 1965 to a standard NASA design as part of NASA's Manned Space Flight Network, established to support the Apollo manned missions to the moon. Apart from the telecast for television, Honeysuckle Creek also had voice and telemetry contact with the Apollo 11 lunar module, all transmissions being through antenna DSS-46. The antenna subsequently provided key communication and data support for all other manned space flight activities by NASA, including Skylab up until 1974 when the entire Honeysuckle creek site was reconfigured to support the Deep Space program. In 1981 upon the closure of the Honeysuckle site, the antenna was relocated to Tidbinbilla and subsequently enlarged in 1983.

The landing of Apollo 11 and subsequent walk on the moon's surface by Neil Armstrong and Buzz Aldrin was one of the defining moments of the 20<sup>th</sup> century. Few events in the last 50 years have galvanised the world as did that first moon landing. The importance of the DSS-46 antenna in terms of engineering heritage is that it is the last remaining tangible reminder of Australia's significant role in this truly momentous engineering achievement. Over the last 44 years, this antenna has been used to receive and transmit data and communications for virtually all of the manned and unmanned NASA space programs and in doing so along with the other Australian ground stations, continues to provide an essential and invaluable contribution to the success of these programs.

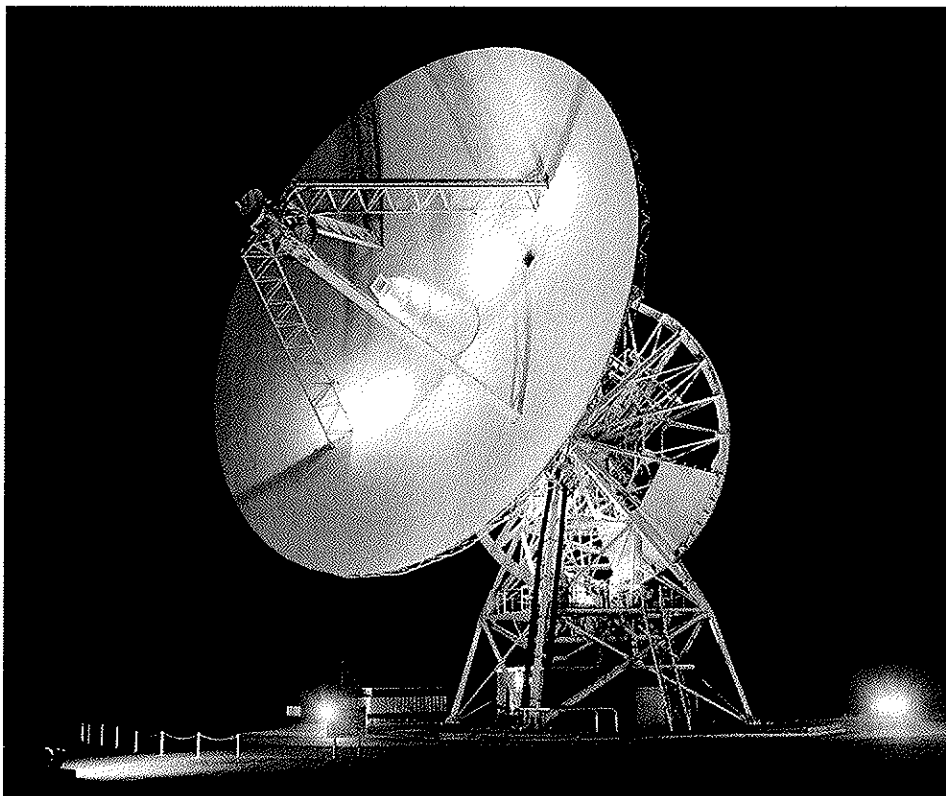
Antenna DSS-46 is due to be decommissioned in August 2009. It is planned at this stage that the antenna will remain on site at Tidbinbilla and be subject to an ongoing 'mothball' maintenance program to retain it in a state where it can be returned to service in the future if required. Recognition of Antenna DSS-46 under the Engineering Heritage Recognition Program will be a tangible reminder of Australia's key involvement in the NASA Manned Space Flight Program.

**Other Heritage Listings:** The American Institute of Aeronautics and Astronautics (AIAA) Historic Sites Committee has selected CDSCC as their **2009 Historic Aerospace Site** (along with the former Honeysuckle Creek and Orroral Valley stations). The selection puts CDSCC alongside facilities such as the NASA Ames Research Center, North American/Rockwell Downey Industrial Site and many other places of importance to the space exploration community.

### **ASSESSMENT OF SIGNIFICANCE**

**Historical Significance:** Antenna DSS-46 is the last functioning major component of the Honeysuckle facility which was established in 1965 as part of NASA's Manned Space Flight Network to support the Apollo manned missions to the moon. It played an integral role in the Apollo 11 mission, providing alone the first historic pictures of man walking on the Moon on Monday, 21st July 1969. The antenna provided key communication and data support for all other manned space flight activities by NASA, including Skylab, and continues to support the Deep Space program.

**Historical Individuals or Association:** Antenna DSS-46 has a well documented link to the Apollo manned space program and in particular, to the initial walk on the moon by Neil Armstrong and Buzz Aldrin. This program was of unprecedented world significance in terms of social, engineering and scientific achievement and benefit.



**Antenna DSS-46 shown at night in its original location at Honeysuckle Creek.**



**Creative or Technical Achievement:** The achievement of the Apollo program in sending man to the moon and safely returning him was at the time at the pinnacle of mankind's aspirations and endeavours. Even today the wonder at what was achieved in this program is breathtaking and the program led the way in a series of space programs that reached further into space.

**Research Potential:** The siting of Antenna DSS-46 at the CDSCC together with its outstanding visitor centre and research facilities provides a valuable tool for ongoing research and public education.

**Social:** The journey to the moon and back had tremendous worldwide social impact in 1969. The story has been told in film, song and literature and continues to be recognised for its social impact. Within Australia the role of the various facilities and their contribution to the program continues to be recognised and provides a common bond for those that have contributed to the various space programs over the years.

**Rarity:** Antenna DSS-46 is the last remaining key element of the Honeysuckle Creek site involved in receiving the signals from the moon on 21 July 1969.

**Representativeness:** Antenna DSS-46 remain in very good condition and apart from the afore mentioned modifications, it remains essentially as it was on 21 July 1969, albeit relocated to Tidbinbilla. It is representative of the type of antenna used worldwide as part of the Manned Space Flight program.

**References:** see [http://www.cdsc.nasa.gov/Pages2/Antennas/pg02d\\_dss46.html](http://www.cdsc.nasa.gov/Pages2/Antennas/pg02d_dss46.html)

and <http://www.honeysucklecreek.net/index.html>

**Statement of Significance.** Antenna DSS-46 is the last remaining significant component of Australia's involvement in one of the greatest engineering achievements of the 20<sup>th</sup> Century; mankind's journey to the moon and safe return. Antenna DSS-46 alone received the historic images of Armstrong's first steps on the moon on 21 July 1969, and provided the vital communications link between the Apollo astronauts and Mission Control in Houston as the entire world watched. It has National significance due to the key role in what was an event of international significance.



### **Proposed Recognition Panel and Plaque**

CDSCC plans to erect an interpretive panel near Antenna DSS-46 that will be unveiled during celebrations to mark the 40<sup>th</sup> anniversary of the Apollo 11 mission. EHC propose that if recognition is granted under the EHA Engineering Heritage Recognition Program, liaison with CDSCC will occur to ensure consensus is reached on the form and wording of the interpretive panel. In addition, a recognition Marker would be placed adjacent to the antenna and interpretive panel.